

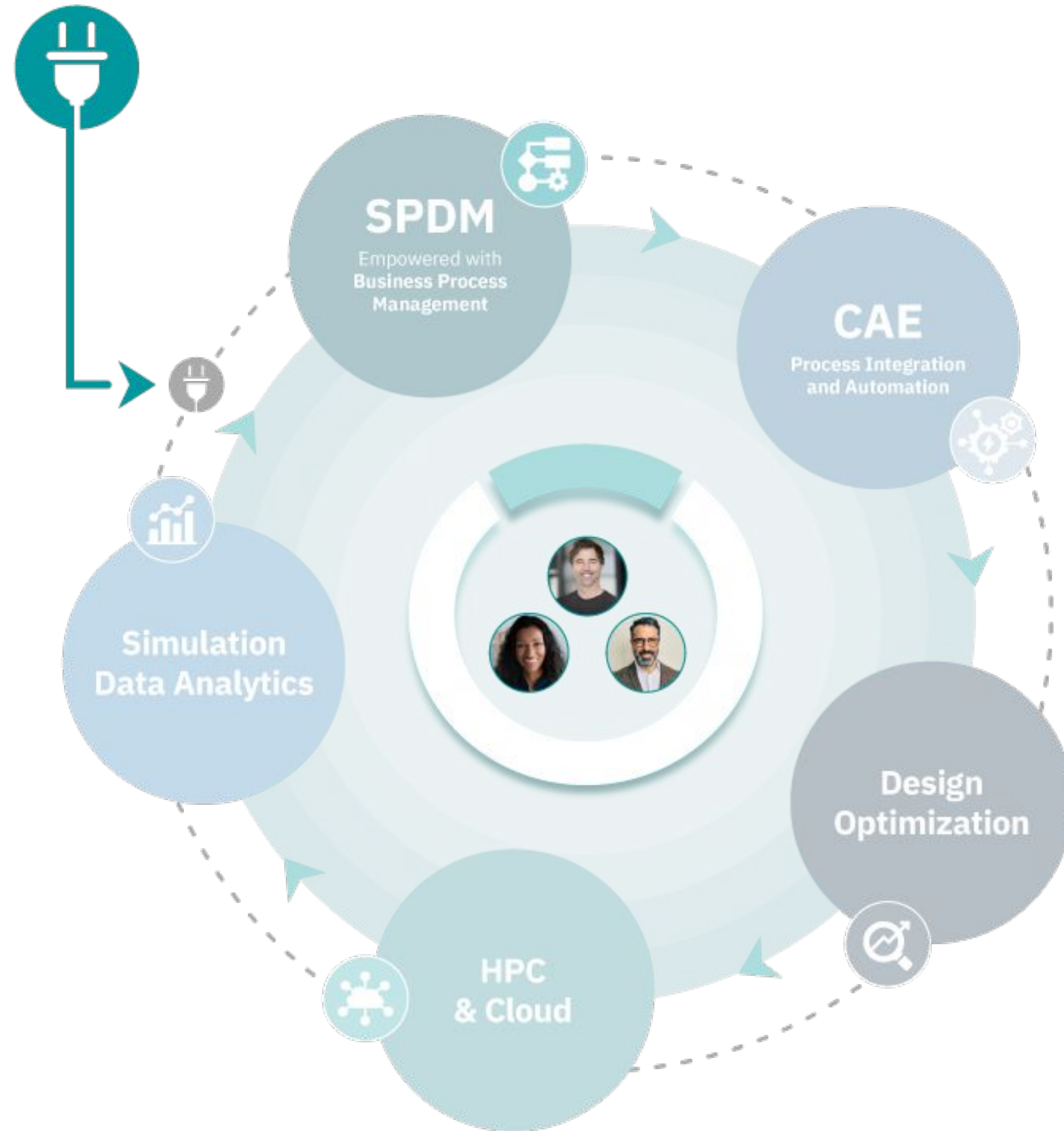


runbox: an API-based verticalization



Marco Turchetto
VOLTA Product Manager

Open Architecture

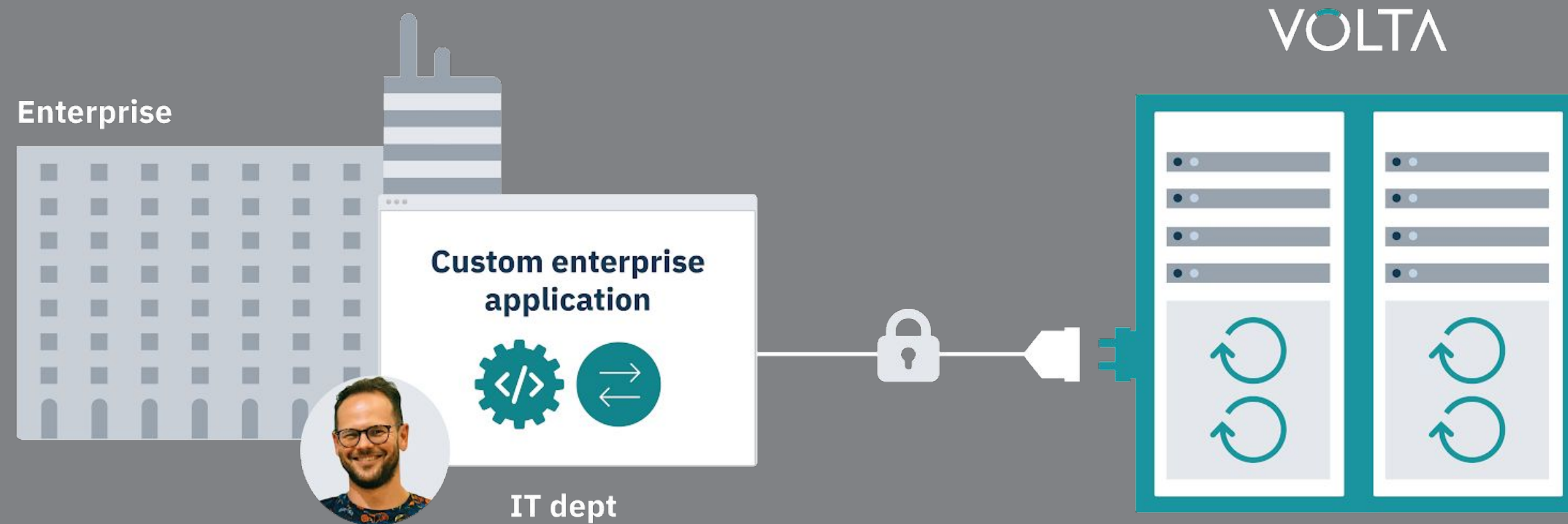


Connect simulation to the digital thread of product data with VOLTA Application Programming Interfaces (APIs).



Interoperability with other enterprise systems

VOLTA APIs guarantees digital continuity: integration with PLM systems and company's digital thread.

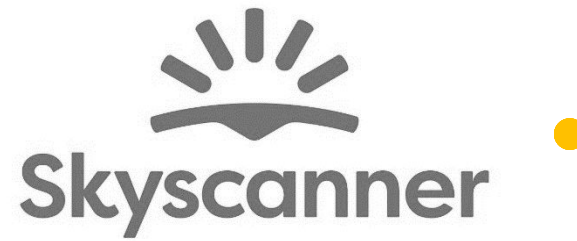


What's an API?

An API, Application Programming Interface, is a set of tools and programming code that enables data transmission between one software product and another.



What happens when you book a flight?



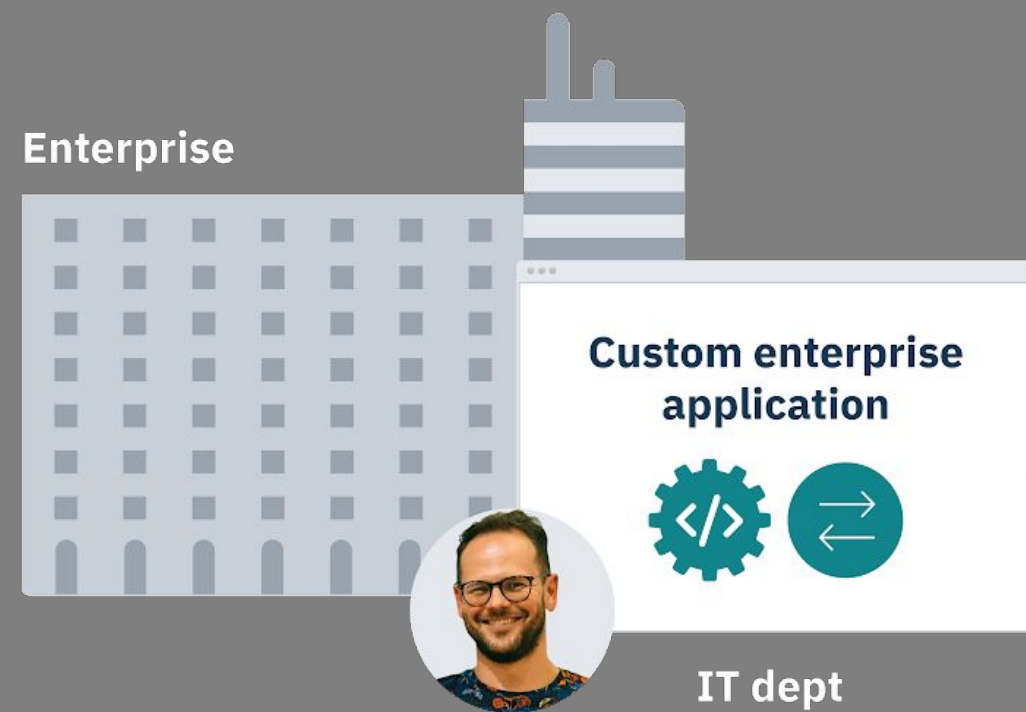
Google Flights



- API
- API
- API
- API
- API
- API
- API



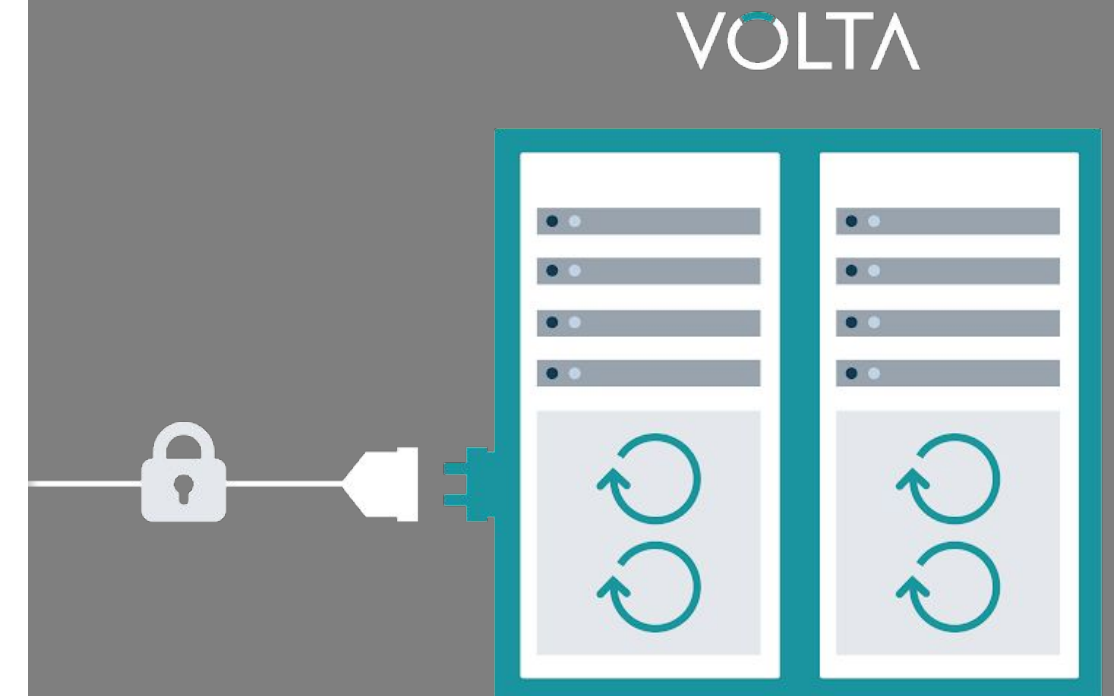
VOLTA API Endpoints



VOLTA API Documentation

API Reference

- 1 Assign Metadata Options
- 2 Assign Tags
- 3 Create Binary
- 4 Create File
- 5 Create File Version
- 6 Create Folder
- 7 Create Project Plan
- 8 Create Release
- 9 Delete Item
- 10 Download File Version
- 11 Download Folder
- 12 Download Item
- 13 Download Release
- 14 Download Session
- 15 Edit Project Plan
- 16 Get Access Token
- 17 Get Folder Items
- 18 Get Groups
- 19 Get Item
- 20 Get Item Link
- 21 Get Item Path
- 22 Get Item Versions
- 23 Get Metadata
- 24 Get My Files Items
- 25 Get Project Models
- 26 Get Project Models
- 27 Get Project Plan
- 28 Get Project Plans
- 29 Get Project Sessions
- 30 Get Queues
- 31 Get Release Names
- 32 Get Session Plan Configuration
- 33 Get Shared Items
- 34 Get Team Items
- 35 Get Teams
- 36 Get User Profile
- 37 Get Users
- 38 Move Item
- 39 Rename Item
- 40 Run Model as DOE
- 41 Run Model as Optimization
- 42 Run Model as Single Design
- 43 Run Model Version as DOE
- 44 Run Model Version as Optimization
- 45 Run Model Version as Single Design
- 46 Search
- 47 Share Item
- 48 Stop Session
- 49 Trash Item

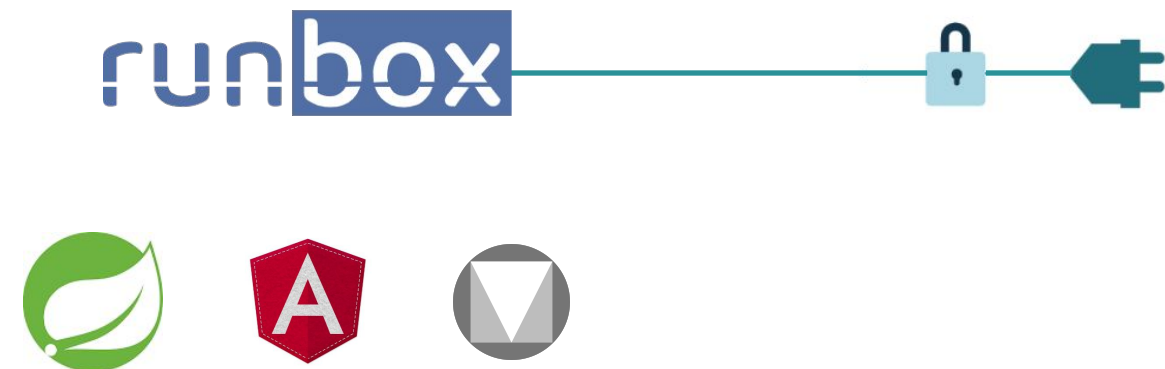


runbox

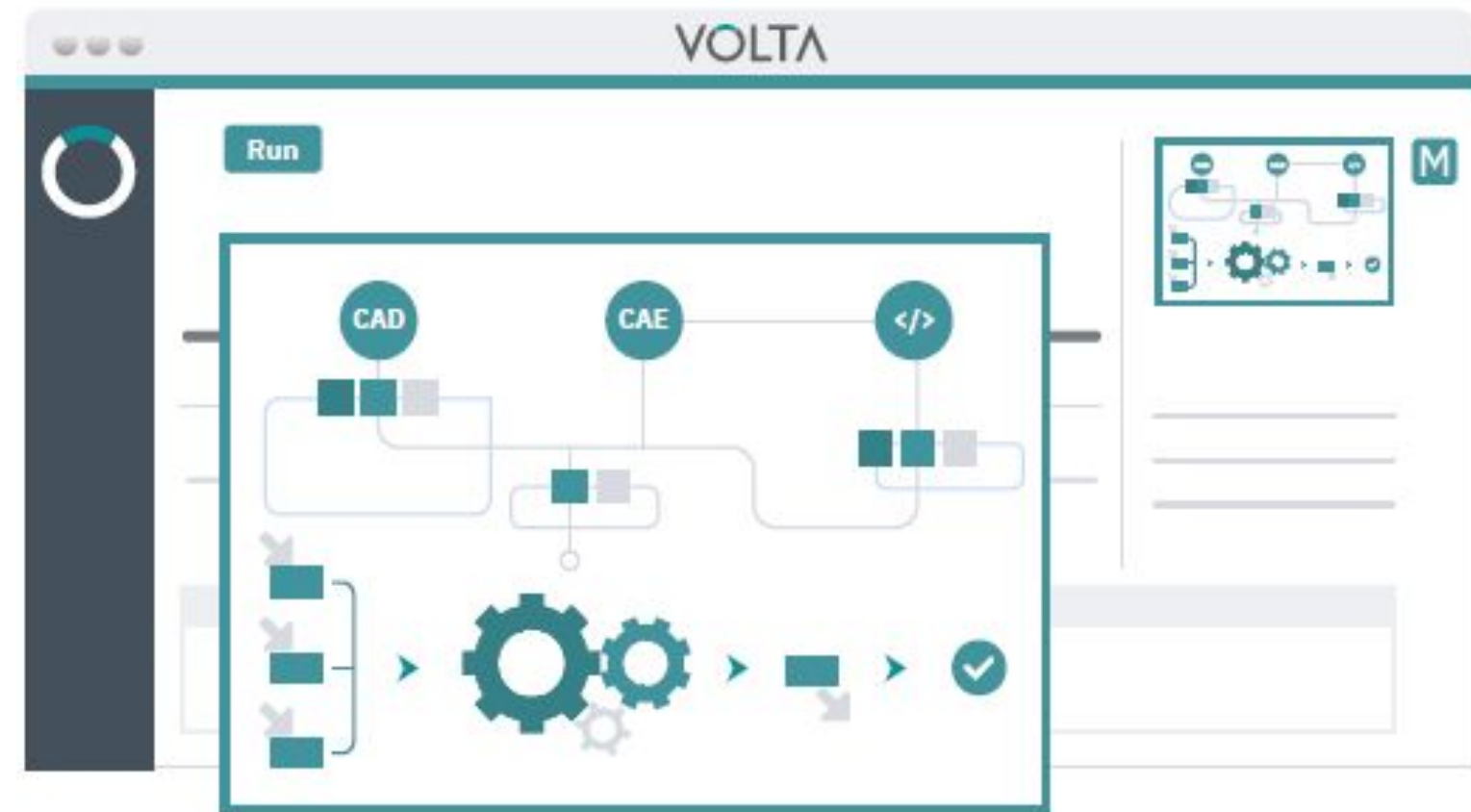
■ An API-based verticalization for Simulation Democratization

Democratization

Other Stakeholders
(CAD Designer, Supplier,
Customer,...)

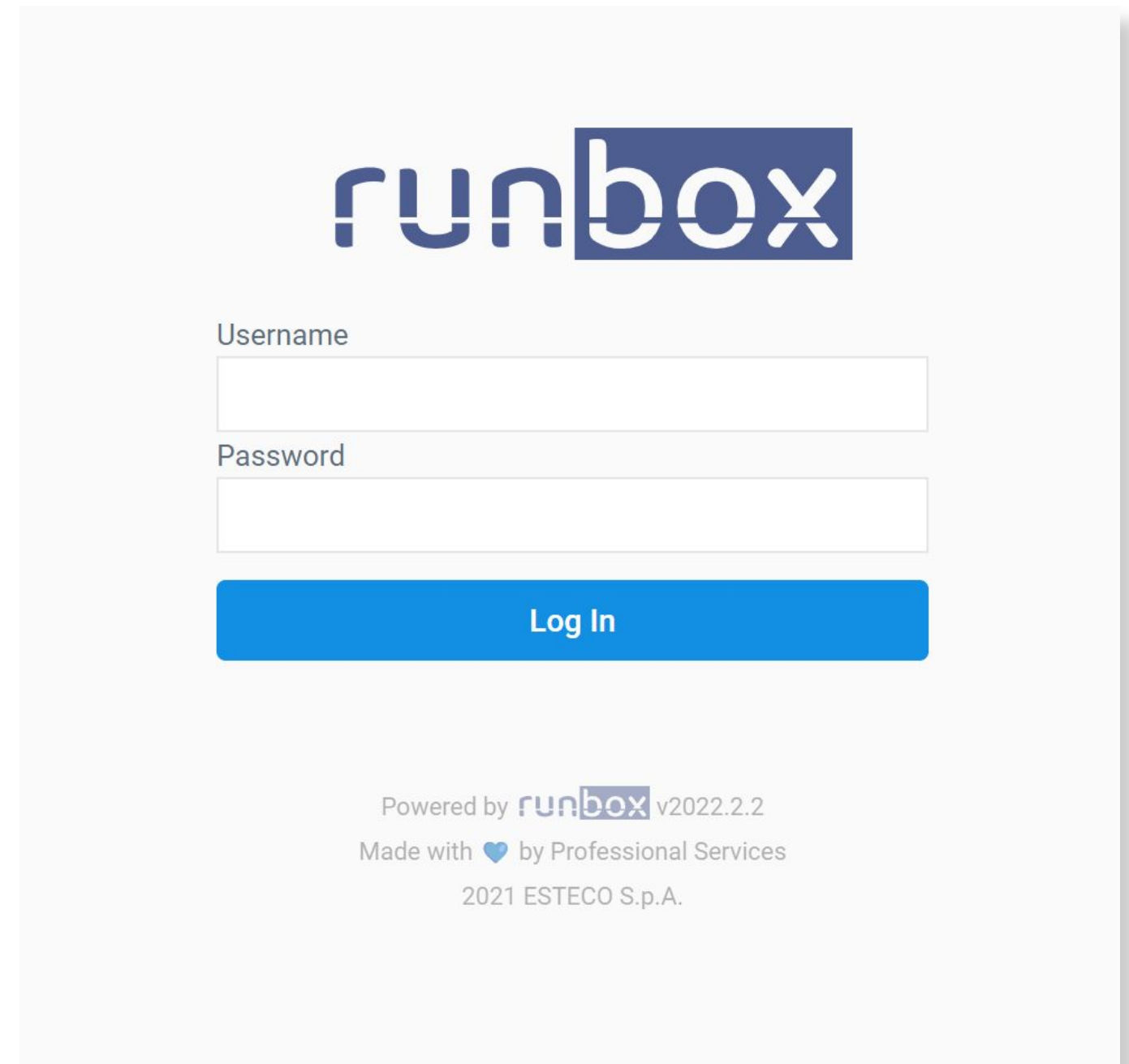


CAE Engineers & Method
Developers



runbox login

- Web-based
- Login in the verticalization
- No direct login to VOLTA



The screenshot shows a login page for 'runbox'. At the top center is the 'runbox' logo, where 'run' is in blue and 'box' is in white on a blue background. Below the logo are two input fields: 'Username' and 'Password'. The 'Username' field is a simple white box with a thin border. The 'Password' field is a white box with a thin border and a small eye icon on the right side to toggle visibility. Below these fields is a prominent blue button with the text 'Log In' in white. At the bottom of the page, there is a footer with the text: 'Powered by runbox v2022.2.2', 'Made with ❤️ by Professional Services', and '2021 ESTECO S.p.A.'.



Simulation Expert

runbox configuration

Select parameters to show

runbox ▶ RUNBOXES RESULTS PM

Create new Runbox

[Create a new Runbox Configuration](#) or [edit an existing one](#) Publish

Name*
Heat Sink Simulation

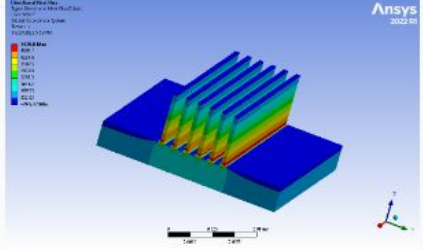
Short Description
This runbox simulates a Heat Sink.

Submission Mode
All in One

Queue
[2] Execution

Model
HeatSink_MDO (v1) Change Model

Description
A heat sink is a passive heat exchanger that cools electronic devices by transferring heat to air or liquid, regulating their temperature. It's used in computers for CPUs, GPUs, and high-power semiconductor devices.

Snapshot
 Change Snapshot

Scalar Inputs String Inputs Matrix Inputs File Attachments Outputs DOE Table Dependencies

Edit

<input type="checkbox"/>	Visible	Plottable	Type	Name	Tag	Long Name	Unit	Format	Value	Lower Bound	Upper Bound	Step
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	continuous	d1		d1	Unit	0.0000E0	2	1.8	2.2	0.0001
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	constant	Depth		Depth	Unit	0.0000E0	22	19.8	24.2	0.0001
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	continuous	h1		h1	Unit	0.0000E0	8	7.2	8.8	0.0001
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	continuous	h2		h2	Unit	0.0000E0	3	2.7	3.3	0.0001
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		t1		t1	Unit	0.0000E0	1	0.9	1.1	0.0001
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	continuous	W		W	Unit	0.0000E0	22	19.8	24.2	0.0001



Other Stakeholder

(CAD Designer, Supplier, Customer,...)

My runboxes

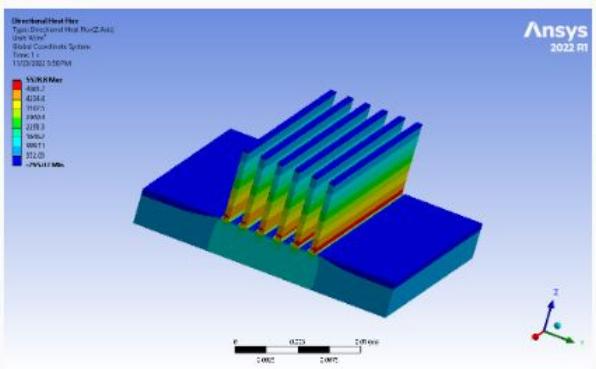
The screenshot displays the 'Runboxes' web interface. At the top, there is a dark blue navigation bar with the 'runbox' logo on the left, a play button icon followed by 'RUNBOXES', a grid icon followed by 'RESULTS', and a circular profile icon with 'PM' on the right. Below the navigation bar, the main content area has a white background. On the left, the heading 'Runboxes' is displayed, with the subtitle 'View and Access all the RUNBOXES you have access to' underneath. To the right of this text is a blue button labeled 'Create New'. The main area contains two simulation project cards. The first card, titled 'Heat sink simulation', features a 3D thermal analysis image of a heat sink with a color scale legend on the left and the 'Ansys' logo on the right. The second card, titled 'Gasket_simulation' with the subtitle 'Gasket Single Run simulation', shows a 2D finite element mesh of a gasket. Both cards have a small 'v7' icon in the top right corner.



Configuration Setup

runbox ▶ RUNBOXES **RESULTS** PM

Heat sink simulation v1 Run this Configuration



Define Run Parameters

Other

d1	1.8	2	2.2	<input type="text" value="2"/>
h1	7.2	8	8.8	<input type="text" value="8"/>
h2	2.7	3	3.3	<input type="text" value="3"/>
t1	0.9	1	1.1	<input type="text" value="1"/>

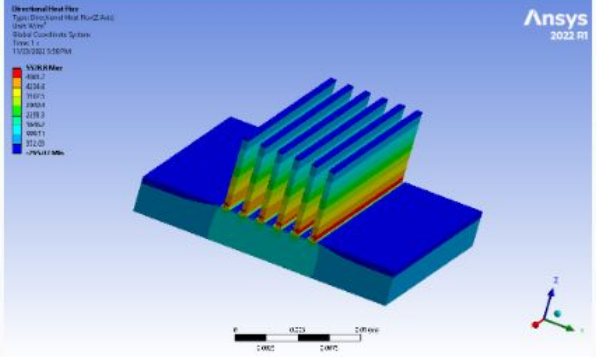
Problem Outputs

- Directional_Heat_Flux_Average
- DirHeatFlux_gif
- Temperature_Maximum
- Temperature_png
- Total_Heat_Flux_Average
- Volume_Total

Configuration Setup

runbox ▶ RUNBOXES **RESULTS** PM

Heat sink simulation v1 Run this Configuration



Problem Outputs

- Directional_Heat_Flux_Average
- DirHeatFlux_gif
- Temperature_Maximum
- Temperature_png
- Total_Heat_Flux_Average
- Volume_Total

Define Run Parameters

Other

d1	1.8	1.923	2.2	1.923
h1	7.2	8.4188	8.8	8.4188
h2	2.7	3.1072	3.3	3.1072
t1	0.9	1.0557	1.1	1.0557

Running the simulations

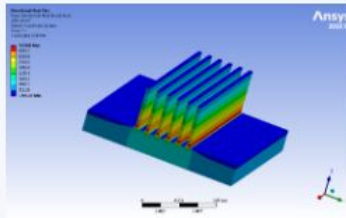


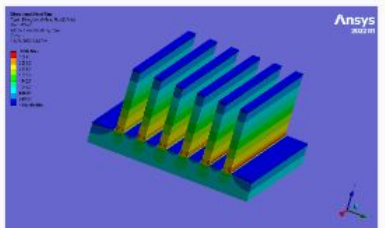
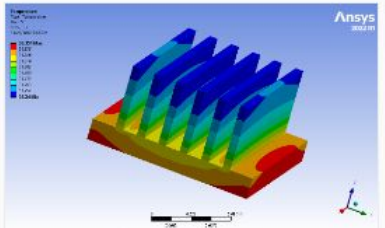
Results

runbox ▶ RUNBOXES ■ RESULTS PM

My first HeatSink runbox **finished**

Created by Project Manager (ProjectManager) on Nov 28, 2022, 5:39:15 PM

 Runbox
[Heat sink simulation](#)
Description

INPUTS		OUTPUTS	
d1	1.9000e+0	Directional_Heat_Flux_Average	1.2034e+3
h1	8.4000e+0	DirHeatFlux_gif	 View Full Screen
h2	2.8000e+0	Temperature_Maximum	3.3351e+1
t1	1.0500e+0	Temperature_png	 View Full Screen
		Total_Heat_Flux_Average	1.2520e+3
		Volume_Total	-2.5194e+0





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